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SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/252,384	06/01/94	MCDANIEL	C TAMK145

EXAMINER
LOW, C

ART UNIT	PAPER NUMBER
1814	21

DATE MAILED: 08/24/94

18M2/0824

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This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☒ Responsive to communication filed on 1 June 1994 ☒ This action is made final.

A shortened statutory period for response to this action is set to expire three (3) month(s), 0 days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☒ Claims 53-64 are pending in the application.
   Of the above, claims 17-24, 34-36, 41-52, and 65-70 remain withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 53-64 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

PTOL-326 (Rev. 2/93)

The text of those sections of Title 35, U. S. Code not included in this action can be found in a prior Office Action.

The preliminary amendment filed 13 August 1992 canceling claims 1-16, 30-33, 37-40 and 71 is noted. The claims pending for prosecution are 17-29, 34-36, and 41-70. It is also noted that applicant has indicated an election to prosecute claims 53-64, 67, and 68 in this application.

The application remains objected to because of alterations which have not been dated as is required by 37 CFR 1.52(c) and 1.56. A properly executed affidavit or declaration signed by all of the inventors identifying the alterations and stating when the unsigned and/or undated alterations were made is required. If the alterations were made before the signing of the oath or declaration, a new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by its Serial Number, filing date and the title is also required. If the alterations were made after the signing of the oath or declarations, a full explanation and cancellation of such alterations is required. Attention is directed to page 8, line 19, page 10, line 24, page 17, lines 30 and 32, page 19, line 23, page 23, line 23, page 24, lines 10 and 24, page 29, lines 13 and 14, page 35, lines 13 and 26, page 39, lines 6 and 8, page 40, line 12, page 41, lines 33 and 34, page 44 (Table 6), which contain initialed but undated corrections to the specification. See also the claims.

The use of what are apparently trademarks has been noted in this application should be capitalized wherever it appears and be accompanied by the generic terminology. The use of trademarks is permissible in patent applications, however, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks. Attention is directed to at least the following: "diazinon", "paraoxon", "parathion", and "durban". The specification should be reviewed for use of other tradenames/trademarks besides those mentioned.

Correction of the foregoing is required.

Insofar as claims 17-29, 34-36, and 41-70 remain in the application and claims 53-64, 67, and 68 are indicated as elected in the preliminary amendment filed 13 August 1992, the requirement for restriction as made in the parent application with serial number 07/344,258 is

set forth below in modified form to reflect the cancellation of claims 1-16, 30-33, 37-40, and 71.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 17-19, 34 and 41, drawn to a transgenic organism (i.e. a multicellular organism) are, for example, classified in at least Class 800, subclass 2.

II. Claims 20-29, 35, 36, 42, and 43, drawn to a method for making bacterial organophosphorous acid anhydrase are, for example, classified in at least Class 435, subclasses 69.1.

III. Claims 44-52, drawn to organophosphorous acid anhydrase are, for example, classified in at least Class 435, subclass 183.

IV. Claims 53-64, drawn to a method of detoxifying an organophosphorous compound by exposure to the organophosphorous acid anhydrase are, for example, classified in at least Class 435, subclass 262.5.

V. Claims 65 and 66, drawn to a method of detecting bacterial colonies capable of detoxifying organophosphorous acid anhydrides are, for example, classified in at least Class 435, subclass 7.4.

VI. Claims 67-69, drawn to a method of protecting insects by feeding the insects or infecting the insects or its environment with microorganisms which express via a vector an organophosphorous acid anhydrase is, for example, classified in Class 424, subclass 93R.

VII. Claim 70, drawn to a pesticide is, for example, classified in Class 424, subclass 405.

The inventions are distinct, each from the other because of the following reasons:

The invention of Groups I, III, and VII are distinct and/or independent because neither Group III (enzyme) nor Group VII (insecticide) are an intact multicellular animal nor do the claims of Groups III and VII require a transgenic animal of Group I for their practice. The anhydrase of Group III can be obtained from its natural source as produced from bacteria. Moreover, Groups III and VII are different products as the pesticide with inhibitor of bacterial organophosphorous anhydrase is not the enzyme nor is the enzyme an inhibitor. Note that Groups II and IV to VI are methods of use that do not require or use the intact transgenic animal.

The inventions of Group II and III are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different products or (2) that the product as claimed can be made by another and materially different process (MPEP 806.05(f)). In the instant case, the enzyme can be obtained from bacteria that naturally produce the enzyme and do not need or require the particulars of a transformed microorganism. See Lewis *et al.* (BZ) and Chiang *et al.* (BE).

The invention of Group III is related to Groups IV, V, and VI as product and processes of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP 806.05(h)). In the instant case, Groups IV to VI are alternative processes of use, each of which do not require all of the particulars of any one other group as in Group IV exposure to the enzyme does not require detection of bacteria or protection of insects nor does detection of bacteria require protection of insects. Moreover, in Group IV, detoxification by exposure to the enzyme can be accomplished by using microorganisms to detoxify the organophosphorous compounds or by basic hydrolysis, dilution in aqueous medium, or incineration (see the specification at page 2).

Because these inventions are distinct for the reasons given above and since they have acquired a separate status in the art as shown by their different classification, subject matter, and are separately and independently searched, restriction for examination purposes as indicated is proper.

A telephone conversation with Patricia Kammerer on 13 December 1992 resulted in a provisional election without traverse to prosecute the invention of Group IV, claims 53-64 and reconfirmed on 02 December 1993. Affirmation of this election must be made by applicant in responding to this Office action. Claims 17-29, 34-36, and 41-52 and 65-70 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to non-elected inventions.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the

currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to provide a reasonable written description for practicing the claimed invention insofar as the present claims indicate using a "recombinant" organophosphorous acid anhydrase. It is pointed out that the specification recites using *P. diminuta* and a *Flavobacterium* sp (ATCC 27551) (see the cited references to Harper *et al.*, BX, and McDaniel *et al.*, BY) which set forth DNA sequences coding for *opd* where the organophosphorous acid anhydrase DNA set forth in Figure 1 of the specification are only partially identical. From the recited examples in the specification, it is not readily apparent that the species of bacteria are any different, that the plasmids used are any different, that the isolated DNA that was sequenced was any different, that the functionality encoded by the DNA is any different, and yet the sequences recited in the Harper *et al.*, McDaniel *et al.*, Mulbry *et al.* (1) and Figure 1 of the specification set forth different DNA sequences coding for what is apparently the same enzyme. Note that page 21 of the specification recites using the plasmid pCMS1 (fig. 2 of Harper *et al.*) and sets forth the DNA sequence (fig. 1). This is apparently the same plasmid and DNA as in the specification (compare the paragraph bridging pages 23 and 24 of the specification and the McDaniel *et al.* reference, see RESULTS). Note also that fig. 4 of the McDaniel reference is identical to fig. 2 of the present application. Thus, there are apparently at least three different references all directed to the apparently identical genetic material where no one reference indicates a sequence identity for the apparently identical genetic material and therefore, a query is raised as to what genetic material is disclosed as coding for the organophosphorous acid anhydrase used in the process of detoxification as each is apparently different and given that there are three disparate sequences, it is not clear that one of ordinary skill in the art using solely the disclosure in the application would have obtained the appropriate organophosphorous acid anhydrase which is defined by the amino acid sequence of Figure 1.

Note in particular the indication in the response filed 28 October 1991 at page 15-16 indicating a 2% difference in sequence and the request to alter the sequence of Figure 1 (page 18). It is not clear what changes have been made in substitute Figure 1, as it is not apparently of record. It is noted that the above response cites *Ex parte Marsili et al.* among others

(footnote, page 18-19 of the response), however, in *Marsili*, the specification was adequately enabling to support the change in formula of a chemical compound (note that a DNA polymer is not the same compound as an imidazole) whereas here, the process uses a recombinant enzyme defined by the DNA encoding the enzyme organophosphorous acid anhydrase where the specific amino acid sequence is a critical feature to the function of the enzyme. Here the specification and the response alone do not show what changes applicant intends to make and whether or not those changes would have been adequately supported by the specification as originally filed, nor has any change been shown to have been an inherent characteristic of the disclosed and presently claimed process. Thus, *Ex parte Marsili et al.* among others is not definitive for showing the precedence of altering the DNA sequence of Figure 1 as originally filed in the instant application. The comments regarding Exhibit A in the response have been considered (page 15+ of the above response) and is clearly indicative that the sequence as indicated in the application and those which have been published are disparate. Thus, the query of which sequence is correct still remains and given those disparities, it is apparent that the written description is fatally flawed as the sequence comparison (Exhibit A) shows by indication of several hyphens, "-", defined as a "... base is missing ...", and, that the sequence as originally filed is incomplete as is evident from the comparative evidence of Exhibit A. Note the numerous hyphens in the sequence indicated to be that which conforms to application figure 1. In the previous Office Action in the parent application, the specification was objected to because of the apparent disparity between the published sequences and the sequence set forth in the present application. In view of the disparities (Exhibit A filed with the response) and the request to correct the sequence shown in Figure 1, it is clearly apparent that the present application lacks an adequate written description for practicing the claimed invention with regard to the correct DNA sequence. Previously, Figure 1 of the present application was in one alternative the correct sequence, however, from Exhibit A, it is now clear that the sequence shown in Figure 1 in the present application is incorrect. Thus, the objection is not removed by the explanation and exhibit in applicants' response of 28 October 1991 and in view of the claims reciting a "recombinant organophosphorous acid anhydrase" used in the process where that organophosphorous acid anhydrase is defined by the sequence in Figure 1 and in view of the stated intention to correct Figure 1, the specification remains objected to.

The disparities (Exhibit A filed with the 28 October 1991 response) and the request to correct the sequence shown in Figure 1 clearly show a lack of a reasonable written description

for practicing the claimed invention with regard to the correct DNA sequence nor does the exhibit indicate whether or not such changes in the DNA affect the amino acid sequence in shown in Figure 1 of the present application which is in one alternative the correct sequence, however, from Exhibit A, it is clear that the sequence shown in Figure 1 in the present application is incorrect. Thus, the objection to the specification is not removed by the explanation and exhibit in the response of 28 October 1991. In view of the present claims to a process using the recombinant enzyme and the intention to correct Figure 1, the objection is not seen as removable by minor correction or explanation of which amino acid sequence for organophosphorous acid anhydrase as coded for by the DNA sequence (the prior art or that of Figure 1 in the present application) is the correct sequence.

Insofar as the present specification discloses an enzymatic reaction resulting in degradation of the organophosphorous compounds by conversion into different product compounds, the present specification fails to disclose the process as occurring simply by exposing the enzyme to the compound. Note that simply "exposing" does not necessarily result in a detoxified compound as an organophosphorous compound which is not a substrate for the enzyme is not detoxified nor does "exposing" the compound to inactive enzyme result in a detoxified compound absent conditions effecting enzymatic conversion of substrate (the organophosphorous compound) into different product compounds or that the enzyme is effective for detoxifying all organophosphorous compounds such as phosmet or phosphocreatine (see *The Merck Index*) both of which are organophosphorous compounds (i.e., organic compounds containing at least one phosphorous atom, see *Hawley's Condensed Chemical Dictionary*) as is DNA. Note that the present specification does not teach or disclose how to detoxify DNA or any other of a wide range of organophosphorous compounds.

Claims 53-64 are rejected under 35 U.S.C. 112, first paragraph, for the reasons set forth in the objection to the specification.

Claims 53-64 are rejected under 35 U.S.C. 112, first paragraph, as the disclosure is enabling only for claims limited to the specifically disclosed compounds such as parathion, paraoxon, and methyl parathion and the specifically disclosed enzyme as defined by the amino acid sequence shown in specification figure 1 (note the above objection to the specification) because the present specification discloses an enzymatic reaction resulting in degradation of the organophosphorous compounds by conversion into different product compounds, the present

specification fails to disclose the process as occurring simply by exposing the enzyme to the compound. Note that simply "exposing" does not necessarily result in a detoxified compound as an organophosphorous compound which is not a substrate for the enzyme is not detoxified nor does "exposing" the compound to inactive enzyme result in a detoxified compound absent conditions effecting enzymatic conversion of substrate (the organophosphorous compound) into different compounds or that the enzyme is effective for detoxifying all organophosphorous compounds such as phosmet or phosphocreatine (see *The Merck Index*) both of which are organophosphorous compounds (i.e., organic compounds containing at least one phosphorous atom, see *Hawley's Condensed Chemical Dictionary*) as is DNA. Note that the present specification does not teach or disclose how to detoxify DNA or any other of a wide range of organophosphorous compounds. See MPEP 706.03(n) and 706.03(z).

Claims 53-64 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 53 is incomplete as there is no stated result of the effect of exposing the compound with the organophosphorous acid anhydrase. Note that simply "exposing" does not necessarily result in a detoxified compound as an organophosphorous compound which is not a substrate for the enzyme is not detoxified nor does "exposing" the compound to inactive enzyme result in a detoxified compound. Insofar as the claims recite "organophosphorous compound" as noted in *Hawley's Condensed Chemical Dictionary*, the term refers to any compound containing carbon and phosphorous and is unclear as to whether or not the terminology is meant to be so inclusive as to include all organophosphorous compounds or whether it is meant to include only such compounds as parathion, paraoxon, and methyl parathion disclosed in the instant specification.

Claims 53, 54, 58, 59-63 are rejected under 35 U.S.C. 102 (a) as anticipated by or, in the alternative, under 35 U.S.C. 103 as obvious over McDaniel *et al.* (BY) which discloses that organophosphorous acid anhydrase detoxifies organophosphorous compounds (see reference page 2306 and 2307) by conversion to products wherein the disclosed enzyme was obtained from a transformed microorganism. Here, the reference discloses cloning and expression of an *opd* gene encoding a phosphotriesterase using the same strains, vectors, restriction enzymes, and DNA fragment. Note the unexplained disparity of the sequences where given the fact that DNA is apparently the same DNA that was sequenced in the McDaniel *et al.* reference, the DNA is the same. In the alternative, given the starting

materials and teachings in the McDaniel *et al.* reference, it would have been obvious that the ordinary skilled artisan would have obtained from using the disclosed probes, DNA coding for the enzyme that was the same as that of the claims and used same in the disclosed process of degrading organophosphorous compounds.

Claims 3, 54, 58, 59-63 are rejected under 35 U.S.C. 102 (a) as anticipated by or, in the alternative, under 35 U.S.C. 103 as obvious over Harper *et al.* (BX) which discloses (page 2586) the recombinant enzyme as degrading organophosphorous compounds wherein the enzyme was obtained from cloning and expression of an *opd* gene encoding a phosphotriesterase where the DNA sequence is the same for *P. diminuta* and a *Flavobacterium* sp (ATCC 27551). Note that the same strains, vectors, restriction enzymes, and DNA fragment are used in the present application and that there is an unexplained disparity of the sequences where given the fact that DNA is apparently the same DNA that was sequenced in the Harper *et al.* reference, the DNA is the same. In the alternative, given the starting materials and teachings in the Harper *et al.* reference, it would have been obvious that the ordinary skilled artisan would have, using the recited teachings, obtained the enzyme and used same in the process of degrading organophosphorous compounds.

Claims 53, 58, and 60 are rejected under 35 U.S.C. 102 (b) as anticipated by Wild *et al.* (AT) who disclose exposing the organophosphorous acid anhydrase to organophosphorous compounds (see at least pages 629-630) as well as cloning and expression of DNA coding for organophosphate degrading enzymes from *P. diminuta* and a *Flavobacterium* which enzymes were used in the same disclosed process of degrading organophosphorous compounds.

Claims 61-63 are rejected under 35 U.S.C. 102 (b) as anticipated by or, in the alternative, under 35 U.S.C. 103 as obvious over Wild *et al.* (AT) who disclose exposing the organophosphorous acid anhydrase to organophosphorous compounds (see at least pages 629-630) as well as cloning and expression of DNA coding for organophosphate degrading enzymes from *P. diminuta* and a *Flavobacterium*. In the alternative where the sequence is not disclosed, routine sequencing would have resulted in determination of the sequence of the cloned DNA which would have produced the deduced amino acid sequence. Where the purified enzyme was sequenced, absent factual evidence to the contrary, it would have been obvious that the enzyme disclosed in the reference has the same sequence as the enzyme in claims 61-63 and been used in the disclosed process of degrading organophosphorous compounds.

Claims 53, 54, and 60 are rejected under 35 U.S.C. 102 (b) as anticipated by McDaniel (AZ) which discloses (see at least pages 45, 62, 101+) degradation (detoxification) of organophosphorous compounds using an enzyme obtained by cloning and expression of an *opd* gene encoding a phosphotriesterase using the same strains, vectors, restriction enzymes, and DNA fragment (see at least page iii, the tables, pages 46, 55-56, 69, figs. 17 and 19, 82, 89-91, and 116-120 and would have been the enzyme used in the disclosed process of degrading organophosphorous compounds.

Claims 61-63 are rejected under 35 U.S.C. 102 (b) as anticipated by or, in the alternative 35 U.S.C. 103 as obvious over McDaniel (AZ) who discloses (see at least pages 45, 62, 101+) degradation/detoxifying organophosphorous compounds using an enzyme obtained by cloning and expression of an *opd* gene encoding a phosphotriesterase using the same strains, vectors, restriction enzymes, and DNA fragment (see at least page iii, the tables, pages 46, 55-56, 69, figs. 17 and 19, 82, 89-91, and 116-120. It is pointed out that while the sequence is not disclosed, in the alternative and absent evidence to the contrary, routine sequencing would have resulted in determination of the sequence of the cloned DNA which would have led to the deduced amino acid sequence or where the purified enzyme was sequenced, absent factual evidence to the contrary, the enzyme disclosed in the reference has the same sequence as the enzyme in claims 61-63 and would have been the enzyme used in the disclosed process of degrading organophosphorous compounds.

Claims 53-54 and 59-64 are rejected under 35 U.S.C. 103 as being unpatentable over Munnecke (AW) taken with Munnecke (CD), McDaniel *et al.* (BY) and Gottlieb (US '959).

Munnecke (AW) discloses processes using microbial enzymes in organophosphorous pesticide cleanup (see at least page 259) of containers, soil (page 260), and waste water (page 261) but where Munnecke (AW) do not set forth the organophosphorous compound in air, one of ordinary skill in the art would have from the citation of Munnecke (CD) by Munnecke (AW) have found it obvious to combine the disclosures of Munnecke (AW) with that of Munnecke (CD) which discloses detoxification of spray tank rinse water (page 507) wherein it would have been obvious to one of ordinary skill in the art to detoxify waste organophosphorous compounds in the aerosol spray (i.e. the compound is in the air). Moreover, where Munnecke (AW) disclose (page 258) that the enzyme was needed, it would

have been obvious to one of ordinary skill in the art to combine the disclosures of Munnecke (AW) and Munnecke (CD) with that of McDaniel *et al.* (BY) which discloses organophosphorous acid anhydrase detoxification of organophosphorous compounds (see reference page 2306 and 2307) by conversion to products wherein the disclosed enzyme was obtained from a transformed microorganism. Here, where the reference discloses cloning and expression of an *opd* gene encoding a phosphotriesterase using the same strains, vectors, restriction enzymes, and DNA fragment. Given the starting materials and teachings in the McDaniel *et al.* reference, it would have been obvious that the ordinary skilled artisan would have obtained from using the disclosed probes DNA coding for the enzyme that was the same as that of the claims and which provides a source of the enzyme for use in the process disclosed by both Munnecke references and Gottlieb who discloses that such enzymes can be used to detoxify gaseous phase organophosphorous compounds (see at least col 3). Moreover, it would have been obvious by logical deduction from Gottlieb by one of ordinary skill in the art that organophosphorous degradation by the enzyme would have prevented contamination by pretreatment of an area with the enzyme which degrades the compound and that one known protective material is a gas mask. Thus, the claimed invention was within the ordinary skill in the art to make and use at the time it was made and was a whole, clearly *prima facie* obvious.

Claims 53-54 and 59-64 are rejected under 35 U.S.C. 103 as being unpatentable over Munnecke (AW) taken with Munnecke (CD), and Wild *et al.* (AT) and Gottlieb (US '959).

Munnecke (AW) discloses processes using microbial enzymes in organophosphorous pesticide cleanup (see at least page 259) of containers, soil (page 260), and waste water (page 261) but where Munnecke (AW) do not set forth the organophosphorous compound in air, one of ordinary skill in the art would have from the citation of Munnecke (CD) by Munnecke (AW) have found it obvious to combine the disclosures of Munnecke (AW) with that of Munnecke (CD) which discloses detoxification of spray tank rinse water (page 507) wherein it would have been obvious to one of ordinary skill in the art to detoxify waste organophosphorous compounds in the aerosol spray (i.e. the compound is in the air). Moreover, where Munnecke (AW) disclose (page 258) that the enzyme was needed, it would have been obvious to one of ordinary skill in the art to combine the disclosures of Munnecke (AW) and Munnecke (CD) with that of Wild *et al.* (AT) who disclose exposing the organophosphorous acid anhydrase to organophosphorous compounds (see at least pages 629-630) as well as cloning and expression of DNA coding for organophosphate

degrading enzymes from *P. diminuta* and a *Flavobacterium* which enzymes would have been used in the disclosed process of degrading organophosphorous compounds set forth in both Munnecke references. Given the starting materials and teachings in the Wild *et al.* reference, it would have been obvious that the ordinary skilled artisan would have obtained enzyme that was the same as that of the claims and which provides a source of the enzyme for use in the process set forth by both Munnecke references and Gottlieb who discloses that such enzymes can be used to detoxify gaseous phase organophosphorous compounds (see at least col 3). Moreover, it would have been obvious by logical deduction from the Gottlieb patent by one of ordinary skill in the art that organophosphorous degradation by the enzyme would have prevented contamination by pretreatment of an area with the enzyme which degrades the compound and that one such piece of protective equipment was a gas mask. Thus, the claimed invention was within the ordinary skill in the art to make and use at the time it was made and was a whole, clearly *prima facie* obvious.

Claims 55-57 are rejected under 35 U.S.C. 103 as being unpatentable over ~~(are rejected under 35 U.S.C. 103 as being unpatentable over~~ Munnecke (AW) taken with Munnecke (CD), McDaniel *et al.* (BY) and Gottlieb (US '959); or, under 35 U.S.C. 103 as being unpatentable over Munnecke (AW) taken with Munnecke (CD), and Wild *et al.* (AT) and Gottlieb (US '959) as applied to claims 53-54 and 59-64 above, and further in view of Grot *et al.* (US '650).

As both Munnecke references disclose detoxification of organophosphorous compounds using an enzyme and either of McDaniel *et al.* or Wild *et al.* disclose a process for obtaining that enzyme in large quantities for the process disclosed in the both Munnecke references and in McDaniel *et al.* and Wild *et al.* which both disclose methods of and produced the enzyme and showed that the recombinant enzyme functioned to effect organophosphorous degradation, and where Gottlieb discloses using enzymes to detoxify gaseous phase organophosphorous compounds (see at least col 3); it would have been obvious by logical deduction from the Gottlieb patent by one of ordinary skill in the art that organophosphorous degradation by the enzyme would have prevented contamination by pretreatment of an area with the enzyme which degrades the compound and that one such piece of protective equipment was a gas mask wherein Grot *et al.* discloses masks that have been pretreated so as to provide protection from and detoxify at least in part organophosphorous compounds (see at least col 12 of Grot *et al.*). It would have been obvious to one of ordinary skill in the art to impregnate masks (disclosed

in Grot *et al.*) for the purpose of detoxification of airborne organophosphorous compounds using the embedded enzymes disclosed in Gottlieb wherein said enzymes are those obtained by the process disclosed in either of McDaniel *et al.* or Wild *et al.* to effect a process such as disclosed in both of Munnecke references as modified by Grot *et al.* and Gottlieb *et al.* which disclose pretreating and embedding the materials to detoxify organophosphorous compounds wherein the method defined by the combined references would have been practices on a mask is a matrix which is a filtration device and is a gas mask. Thus, the claimed invention was within the ordinary skill in the art to make and use at the time it was made and was a whole, clearly *prima facie* obvious.

No claim is allowed.

An inquiry concerning this communication should be directed to Christopher Low at telephone number (703) 308-0196.

CSFL
02 December 1993

Christopher S. F. Low

CHRISTOPHER S. F. LOW
PRIMARY EXAMINER
GROUP 1800